



Abstract #794

English

Reference Mission Scenario Selection for Main Belt Asteroid Mining Missions

In a world with growing energy demands and at the same time increasing expectations on life-standards, the availability of resources becomes a key-problem for future successful economies. The evasion to non-terrestrial sources as a solution to the diminution of valuable materials on Earth has made its way from being of science-fiction character to gaining attention for prospective politics. This paper takes up the issue of accessing extra-terrestrial resources and focuses on the potential commodities on asteroid bodies. It presents an overview on important process phases necessary for a long-term asteroid mining mission, the mission architecture options and spacecraft design derived for each phase as well as a new approach to design mission concepts based on a trade-off of the mission architecture options. As exemplary result, the proposed trade-off method is used to derive a reference scenario for an autonomous asteroid mission into the asteroid main belt. Finally, the first results of the mission analysis for the KaNaRiA asteroid mining mission are presented. In particular, we describe the strategy used in the selection of a suitable parking orbit optimised for energetically efficient access to main belt asteroids.

French

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